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BOTANY

Anther Dehiscence.[1]—A study was begun in 1901 in connection with an article on the pollination of Solanum and Cassia, published in the *Kansas University Science Bulletin*, and continued in 1903 in a thesis presented to the faculty of Washington University for the degree of doctor of philosophy. The author recognizes seven types of apically dehiscent anthers and designates them as araceous, gramineous, polygalaceous, ericaceous, dilleniaceous, Solanum-Cassia, and melastomataceous. First, these types are defined and the families and genera representative of each are indicated. Then there follows an account of the floral ecology of the forms, except of the first four types. Seven tables give the results of the arrangement of the data relating to the geographical distribution of the genera of the several types, and one shows the distribution of the flowering plants in general. Fourteen geographical regions are recognized, based on the floristic regions of Drude. The Tropical American Region shows a maximum of Phanerogamia, the Indian Region being second.

The dilleniaceous, Solanum-Cassia, and melastomataceous types have the corolla, or at least the limb, widely patent, and the anthers basifixed and usually linear.

In the dilleniaceous type the stamens are indefinite, the anthers usually elongate, the flowers usually actinomorphic and highly colored. To this type are assigned 16 genera belonging to 6 families: five genera of Dilleniaceæ, five of Elæocarpaceæ, three of Ochnaceæ, one each of Theaceæ, Bixaceæ, and Flacourtiaceæ. An Indian maximum is indicated for this type, the Tropical American and Australian Regions being next with the same number of genera; the Tropical American Region, however, shows more species than the Australian. As visitors there have been observed: bees — Xylocopa, Euglossa, Bombus, Apis, Melipona, Halictus, Centris, Podalirius; birds — a brush-tongued paroquet, Charmosyna, a honey-sucker, Myzomela; flies — Muscidæ.

The Solanum-Cassia type differs from the dilleniaceous in the stamens being fewer and the filaments short. In this category fall

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[1] Harris, J. Arthur. "The Dehiscence of Anthers by Apical Pores." From the *Sixteenth Annual Report of the Missouri Botanical Garden*, pp. 167–257, issued May 31, 1905.

59 genera belonging to 19 families, 6 of which are Monocotyledons. The Monocotyledons are: one genus of Mayacaceæ, six of Rapateaceæ, two of Commelinaceæ, one of Pontederiaceæ, five of Liliaceæ, four of Amaryllidaceæ. The Dicotyledons are: one genus of Pittosporaceæ, nine of Leguminosæ, three of Tremandraceæ, four of Sterculiaceæ, eleven of Ochnaceæ, two of Dipterocarpaceæ, one of Flacourtiaceæ, sections of Begonia in Begoniaceæ, sections of Ardisia in Myrsinaceæ, one of Loganiaceæ, two each of Gentianaceæ, Solanaceæ, and Rubiaceæ. The table for the Solanum-Cassia type shows a maximum for the Tropical American Region, with the Australian Region second. Genera of visitors observed on flowers of this type are: bees — Osmia, Megachile, Ceratina, Xylocopa, Euglossa, Bombus, Apis, Trigona, Melipona, Halictus, Augochlora, Megacilissa, Melissodes, Podalirius, Centris, Oxæa; flies — Rhingia, Volucella; butterflies — Argynnis; birds — Mimus, Nectarinia, Chlorostilbon.

The melastomataceous type differs from the preceding mainly in the long filaments and in both locules of the anther usually opening through a single pore. Of the 161 genera of Melastomataceæ it includes all except 12, besides one genus of Leguminosæ and two of Bixaceæ. The Tropical American Region contains about 63 % of plants of the melastomataceous type, the Indian Region showing about 20 %. The observed visitors are: bees — Xylocopa, Bombus, Trigona, Halictus, Centris; flies — Syrphidæ; beetles — Cetonia, Buprestis; birds — Trochilidæ.

The table of genera of the three types shows a Tropical American maximum of about 57 %, and an Indian elevation of about 21 %. In Apidæ the Tropical American Region is first, with 64 genera of bees, the Mediterranean-Oriental Region second, with 51, the Northern Region third, with 50. Table J shows the distribution of Hymenoptera of all genera. K shows the relative abundance of genera of Apidæ. Diagram L gives curves for the distribution of endemic genera of the apically dehiscent types, of the Phanerogamia, of the Apidæ, and of all Hymenoptera. Diagram M shows the relative distribution of all genera of the same groups.

These curves indicate a direct relationship between the geographical distribution of the Apidæ and of the dilleniaceous, Solanum-Cassia, and melastomataceous floral types.

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